

Just the Facts...

Safety Glasses and Tinted Lenses

While tinted lenses in glasses are recommended for anyone exposed to the ultraviolet (UV) component of sunlight; the rules are different when a tint is incorporated into safety eyewear for use in the workplace. Sudden changes in illumination levels, such as going from outdoors to indoors, can reduce vision briefly and may increase risk of injury. Most people have experienced this while driving a car into a tunnel from broad daylight; it is very hard to see for the first few moments while the eyes adapt to the new, darker environment. Imagine that experience when walking into a workshop where power equipment is being used.

Any degree of tint in a lens reduces the amount of information available to the eye. Safety glasses with tinted lenses are not to be worn indoors unless the tint is designed for a specific indoor radiant energy hazard.

The American National Standards Institute (ANSI) Standard Z87.1, Occupational and Educational Personal Eye and Face Protection, 2003 edition addresses tints required for tasks that involve optical radiation that may be damaging to the eyes. Tints are to be specific to the hazard and the lenses are to be marked with the shade of the tint that is incorporated in the lens. In most cases, the tints are to protect workers from such hazards as welding, brazing, blast furnaces and other high intensity light sources.

Although photochromic lenses may seem like a good idea, in reality, only safety glasses with clear lenses or special purpose indoor tints may be worn indoors where safety eyewear is required. DA PAM 40-506, 15 JUL 2009, Chapter 5, Section 5-4(e) states that, "Photochromic lenses in industrial safety eyewear may only be used in outdoor locations where movement into and out of buildings or other facilities does not occur."

ANSI further recommends the use of tinted lenses for work in direct sunlight and for inside operations that involve high intensity light sources. However, tints are not recommended for standard inside work with normal illumination. Where a worker moves from an inside to an outside environment and back routinely in the course of work, the solution of choice is a flip-up sunglass attached to the safety glasses. Flipping the tinted lens up as the worker enters a building gives an almost instantaneous view with normal lighting and flipping the tinted lenses down as the worker moves outdoors provides very quick sun protection. Also, note that the use of filters or tinted lenses that reduce light transmittance are "NOT RECOMMENDED" for impact eye protection, unless it is determined that a glare hazard exists as noted in the Selection Chart Annex I in Z87.1-2003.

Employees whose work requires them to be outdoors during daylight hours on a regular basis and for significant amounts of time may use tinted lenses if it is required for them to do their work properly. Clip-on/flip-up tinted lenses meeting ANSI recommendations or a second pair of tinted safety glasses are recommended. The preferred tint is neutral grey or smoke-colored to reduce color distortion effects. Employees who work in eye hazardous areas indoors or in areas of dim illumination where there is no need for protection against radiant energy hazards must use clear safety glasses. Tinted lenses, when required for indoor or outdoor use, should be of sufficient darkness and color to protect against the radiant energy hazard for which they are issued.

The Tri-Service Vision Conservation and Readiness Program of the U.S. Army Public Health Command (Provisional) recommends:

When tinted lenses are required for job performance, they should be in the form of a flip-up lens covering an ANSI Z87.1 device or be in a lens and frame combination meeting ANSI Z87.1 standards. Furthermore, the tinted lenses should be used for outdoor or job specific use only. Tinted lenses will not be worn indoors unless designed for a specific radiant energy hazard.

Photochromic lenses should rarely be authorized since the rate of tint change is too slow to allow movement into and out of buildings where eye injury hazards exist. ANSI Z 87.1 states: "Photochromic lenses shall be used only after a complete hazard assessment and at the discretion of the person responsible for selection of protectors." The supervisor is responsible to ensure safe use of photochromic lenses (that is, outdoor wear only). Photochromic lenses in industrial safety eyewear will only be used in outdoors locations where movement into and out of buildings or other facilities does not occur. When an employee is authorized to wear photochromic lenses, the employee shall bear the additional cost over that of standard clear safety lenses. Photochromic materials must be in plastic or polycarbonate lenses.

The relatively slow rate of tint change in photochromic lenses presents a hazard to workers moving indoors or into other with lower illumination levels than outdoor environments. The initial darkness created by slow tint change combined with lower interior lighting reduces the illumination on indoor tasks and presents an unacceptable risk to employees. Employees wearing photochromic lenses must be made aware of the potential hazard when moving from an area of full illumination to one of reduced illumination.